



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/237,356	01/26/1999	SANDEEP CHENNAKESHU	027575-174	7645

7590 02/27/2002

GREGORY E. STEPHENS
301 EDMORE AVENUE
APEX, NC 27502

EXAMINER

KUMAR, PANKAJ

ART UNIT

PAPER NUMBER

2631

DATE MAILED: 02/27/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/237,356

Applicant(s)

CHENNAKESHU ET AL.

Examiner

Pankaj Kumar

Art Unit

2631

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "s-parameter" is not defined in the claims.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1,2,4,5,6,7,9,10,12,13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kumar US patent no. 5,949,796.

3. Regarding claim 1, Kumar teaches a method for determining a branch metric (col. 31) in a maximum-likelihood sequence-estimation equalizer (fig. 9) which receives at least one antenna signal (fig. 9: input to 201) modulated with M-ary modulation (col. 65: line 67; col. 33: paragraph 8), said method comprising the steps of: pre-computing values equal to a product of a complex number and a hypothetical symbol value (Kumar col. 43 lines 43-45: filter coefficients are convolved by input symbols where convolution inherently means multiplying, storing, and adding); storing said pre-computed values in a product table (Kumar col. 43 lines 43-45: part of convolution; col. 31: lines 25-27 "accumulated"); adding select pre-computed values from said product table to produce a result (Kumar col. 43 lines 43-45: part of convolution; col. 31: lines 25-27 "accumulated"); and determining said branch metric using said result (Kumar col. 31: lines 25-27 "accumulated ... branch metrics ... are compared").

Art Unit: 2631

4. Regarding claim 2, Kumar teaches the method of claim 1 wherein said complex number corresponds to a channel coefficient (Kumar col. 43 lines 43-45).
5. Regarding claims 4, 5, 9, and 13, the discussion for claims 1 and 2 above apply.
6. Regarding claim 6, Kumar teaches the filter according to claim 5 wherein said branch metric is an Ungerboeck branch metric (Kumar col. 48 lines 31-32).
7. Regarding claim 7, Kumar teaches the filter according to claim 5 wherein said branch metric is an Euclidean branch metric (Kumar col. 51 line 52).
8. Regarding claims 10 and 12, the above discussion for claims 6 and 7 apply.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 3, 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar in view of Arslan et al. US patent no. 6,108,517.

Art Unit: 2631

11. Regarding claim 3, Kumar teaches the method of claim 1. Kumar also teaches complex filter coefficients as discussed in claim 2. What Kumar does not teach is a reference to a s-parameter. What Arslan teaches is a reference to a s-parameter (fig. 9). It would have been obvious to one skilled in the art at the time of the invention to modify Kumar to have the s-parameter reference of Arslan. One would be motivated to do so since Arslan teaches in fig. 9 that the s-parameter is used in conjunction with filter outputs for metric processing.

12. Regarding claim 8, Kumar teaches the filter according to claim 5. What Kumar does not teach is that said branch metric is a partial Ungerboeck branch metric. What Arslan teaches is that said branch metric is a partial Ungerboeck branch metric (Arslan et al. col. 11 lines 30-32). It would have been obvious to one skilled in the art at the time of the invention to modify Kumar to have the partial Ungerboeck branch metric. One would be motivated to do so since Arslan states that many other metric variations are possible in lines 30 to 31 of col. 11.

13. Regarding claim 11, the discussion for claim 8 applies.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pankaj Kumar whose telephone number is (703) 305-0194. The examiner can normally be reached on 8:30 AM to 5:30 PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chi H. Pham can be reached on (703) 305-4378. The fax phone numbers for the

Application/Control Number: 09/237,356

Page 6

Art Unit: 2631

organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

PK

February 22, 2002



CHI PHAM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

